F. TSCHUDY.

COMPENSATING DEVICE FOR FURNACES.

APPLICATION FILED OCT. 14, 1910.

994,892.

Patented June 13, 1911.

Fig. 1.

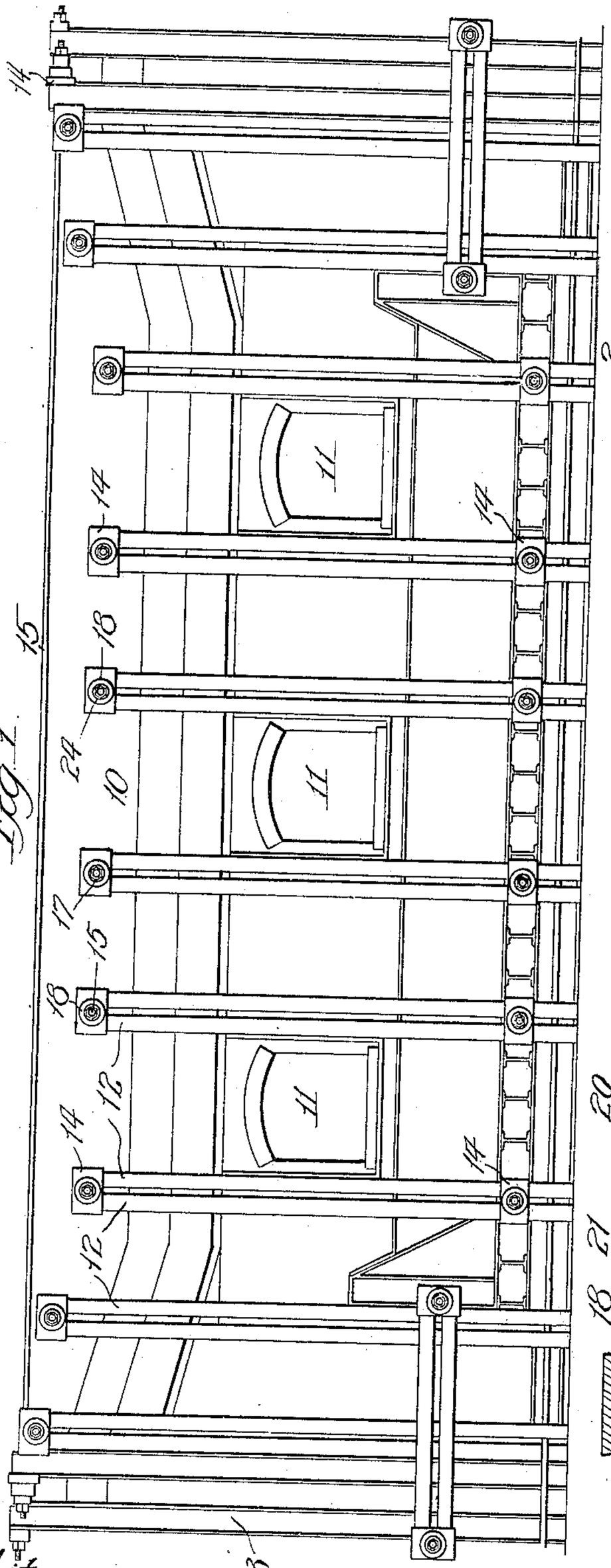

Fig. 3.

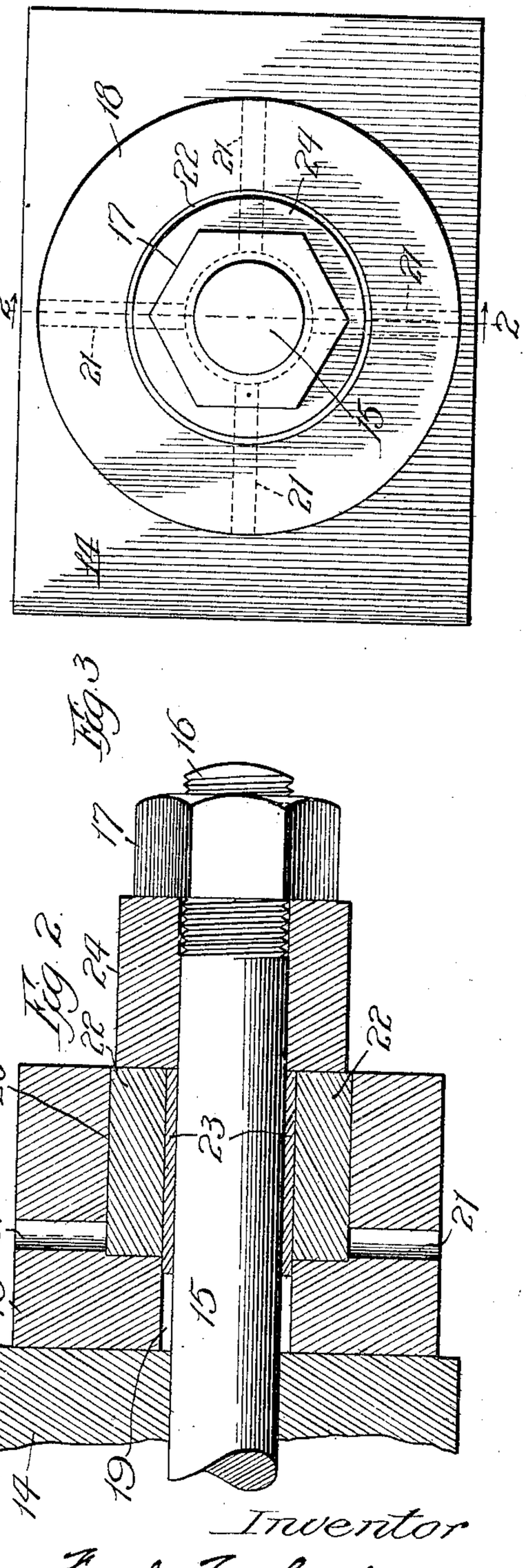

Fig. 2.

Witnesses

Geo. C. Davison

Thos. F. Mooney

Inventor

Fred Tschudy

By Linthicum, Belt & Fuller

Attys

UNITED STATES PATENT OFFICE.

FRED TSCHUDY, OF BIRMINGHAM, ALABAMA.

COMPENSATING DEVICE FOR FURNACES.

994,892. Specification of Letters Patent. **Patented June 13, 1911.**

Application filed October 14, 1910. Serial No. 587,134.

To all whom it may concern:

Be it known that I, FRED TSCHUDY, a citizen of the United States, and resident of Birmingham, county of Jefferson, and State of Alabama, have invented certain new and useful Improvements in Compensating Devices for Furnaces, of which the following is a specification.

My invention relates to coke ovens, open hearth furnaces and reheating ovens, and has particular reference to means for permitting the expansion of the brick work thereof.

In the construction of coke ovens, open hearth furnaces and other structures of this sort, wherein a large quantity of refractory material is employed in connection with structural iron or steel, it is desirable that the parts be securely bound together at the time the structure is completed. It has been found, however, if the said members are securely fastened when the structure is completed that when the fires are started in the furnace and the brick work begins to expand, the stays must be loosened to permit this expansion, otherwise the holding members will be broken. It has been the custom therefore to secure these parts together, particularly in open hearth furnaces, with long bolts or buck stays and when the fires were started and the brick work began to expand, to loosen the nuts on the ends of the bolts to permit such expansion.

This is an undesirable necessity and therefore one of the objects of my invention is to so mount the cross bolts that the expansion of the brick work will be taken care of without the necessity for loosening the nuts on the ends of the bolts from time to time.

Referring to the drawings; Figure 1 is a side elevation of an open hearth furnace having buck stays provided with my improved means for permitting expansion of the brick work. Fig. 2 is an enlarged sectional detail on the line 2—2 of Fig. 3, and Fig. 3 is an end view of the parts as they would appear in operation.

Inasmuch as the open hearth furnace shown in the drawings of itself forms no part of my invention, I will describe the same in a general way only.

The furnace to which my invention is applied, as shown by the drawings, is composed of the furnace portion 10, having openings 11, therein and provided with uprights 12, on the sides thereof and uprights 13, on the ends thereof. At the ends of these upright members, which may be of channel shape or any preferred form, I prefer to mount a member 14, which serves as a seat for the head of the connecting bolt or buck stay. As will be seen, these members 14, are provided both at the top and bottom of the upright members.

In the construction shown in the drawings, the cross bolt or buck stay 15, passes through an opening in the part 14, and has mounted on its threaded end 16, a nut 17. A block 18, is provided with a concentric opening slightly larger at 19, than the diameter of the bolt 15, and at 20, considerably larger than at 19. At the point where the opening 20, is contracted to the size of the opening 19, I provide a plurality of radial interstices 21. Within the opening 20, I seat a soft metal bushing or washer 22, and within this soft metal bushing and seated next to the bolt, I mount a steel bushing 23, which is of approximately the same external diameter as that of the opening 19. The part 18, may be formed of cast iron, if desired, and the part 22, of lead, lead alloy or any other relatively soft metal. Seated on the part 22, is an iron washer 24, with which the nut 17, is adapted to coöperate. As will be seen, if the pull on the nut caused by the expansion of the brick work in the furnace becomes greater than the resistance of the soft metal bushing 22, the metal in the said bushing will be caused to flow outwardly through the radial openings 21, thus relieving the bolts from any extreme strain which would be liable to cause breakage thereof.

It will be understood that although I have shown this means for permitting expansion in connection with an open hearth furnace, it may be applied to various other structures with equal results and further that modifications of my invention may suggest themselves to those skilled in the art and for that reason I do not wish to limit myself to the precise construction herein shown.

I claim:

1. A compensating device for furnaces which comprises in combination, a bolt, a bearing member of hard metal provided with a recess, a nut for said bolt and a washer of relatively soft metal interposed between said bearing member and said nut and seated within the recess in said bearing member, substantially as described.

2. A compensating device for furnaces which comprises in combination, a bolt, a bearing member of hard metal provided with a recess, a nut for said bolt, a washer of relatively soft metal interposed between said bearing member and said nut and seated within the recess in said bearing member, and a washer of hard metal seated between said nut and said soft metal washer, substantially as described.

3. A compensating device for furnaces which comprises in combination, a bolt, a bearing member of hard metal, a nut for said bolt, and a washer of relatively soft metal interposed between said nut and said bearing member, said bearing member being arranged to permit the flow of the soft metal in said washer, substantially as described.

4. A compensating device for furnaces which comprises in combination, a bolt, a bearing member of hard metal provided with a recess, a nut for said bolt and a washer of relatively soft metal interposed between said bearing member and said nut and seated within the recess in said bearing member, said bearing member being provided with openings whereby the soft metal of said washer may escape under pressure, substantially as described.

5. A compensating device for furnaces which comprises in combination, a bolt, a bearing member of hard metal provided with a recess, a nut for said bolt and a washer of relatively soft metal interposed between said bearing member and said nut and seated within the recess in said bearing member, said bearing member being provided with radial openings whereby the soft metal of said washer may escape under pressure, substantially as described.

6. A compensating device for furnaces which comprises in combination, a bolt, a bearing member of hard metal provided with a recess, a nut for said bolt, a washer of relatively soft metal interposed between said bearing member and said nut and seated within the recess in said bearing member, and a washer of hard metal seated between said nut and said soft metal washer, said bearing member being provided with radial openings at the base of said recess, whereby the soft metal of said washer may escape under pressure, substantially as described.

FRED TSCHUDY.

Witnesses:
F. PEITER,
E. G. BERFORD.